Claims

1. A method for the thermal treatment of granular solids in a fluidized bed (3, 3a) which is located in a fluidized-bed reactor (1, 1a, 38), wherein microwave radiation is fed into the fluidized-bed reactor (1, 1a, 38) through at least one wave guide (5, 46), **characterized in** that a gas stream is fed into the fluidized-bed reactor (1, 1a, 38) through the same wave guide (5, 46).

2. The method as claimed in claim 1, **characterized in** that the gas stream introduced through the wave guide (5, 46) contains gases which react with the fluidized bed (3, 3a).

3. The method as claimed in claim 1 or 2, **characterized in** that the gas stream introduced through the wave guide (5, 46) is additionally utilized for a fluidization of the fluidized bed (3, 3a).

4. The method as claimed in any of the preceding claims, **characterized in** that heat is additionally supplied to the fluidized bed (3, 3a) through the introduced gas stream.

5. The method as claimed in any of claims 1 to 3, **characterized in** that the fluidized bed (3, 3a) is cooled by the introduced gas stream.

6. The method as claimed in any of the preceding claims, **characterized in** that the fluidized bed (3, 3a) is part of a stationary and/or circulating fluidized bed.

7. The method as claimed in any of the preceding claims, **characterized in** that the reactor comprises at least two fluidized-bed reactors (1, 1a, 41a to d), which are separated from each other by weirs or partitions (19, 21, 40) such that solids can move as moving bed from one fluidized-bed reactor (1, 41a to c) into an adjacent fluidized-bed reactor (1a, 41b to d).

8. The method as claimed in claim 7, **characterized in** that the operating conditions, in particular temperature, composition of the fluidizing gas, energy input

and/or fluidization rate, can be specified differently for each fluidized-bed reactor (1, 1a, 41a to d).

9. The method as claimed in any of the preceding claims, **characterized in** that by means of the gas stream introduced into the wave guide (5, 46) solid deposits in the wave guide (5, 46) are avoided.

10. The method as claimed in any of the preceding claims, **characterized in** that the used frequency of the microwave radiation lies between 300 MHz and 30 GHz, preferably at the frequencies 435 MHz, 915 MHz and 2.45 GHz.

11. The method as claimed in any of the preceding claims, **characterized in** that the temperatures in the fluidized bed (3, 3a) lie between 300°C and 1200°C.

12. The method as claimed in any of the preceding claims, **characterized in** that the Particle-Froude-Number Fr_p in the wave guide (5, 46) is 0.1 to 100, preferably 2 to 30.

13. A plant for the thermal treatment of granular solids in a fluidized bed (3, 3a), in particular for performing the method as claimed in any of claims 1 to 12, comprising a fluidized-bed reactor (1, 1a, 38), a microwave source (7) disposed outside the fluidized-bed reactor (1, 1a, 38) and a wave guide (5, 46) for feeding the microwave radiation into the fluidized-bed reactor (1), **characterized in** that a gas supply conduit (6) is connected to the wave guide (5, 46) for feeding gas into the fluidized-bed reactor (1, 1a, 38).

14. The plant as claimed in claim 13, **characterized in** that the wave guide (5) has a rectangular or round cross-section, whose dimensions are adapted in particular to the used frequency of the microwave radiation.

15. The plant as claimed in claim 13 or 14, **characterized in** that the wave guide (5, 46) has a length of 0.1 m to 10 m.